BIOFERTILIZERS FOR INCREASING SUSTAINABLE CROP PRODUCTIVITY

(PAK/5/037) D1 New

MODEL PROJECT

CORE FINANCING

YEAR	Experts		Group Activity	Equipment	Fellowships		Scientific Visits		Group Training	Sub-Contracts	Misc. Comp.	TOTAL
	m/d	US $	US $	US $	m/d	US $	m/d	US $	US $	US $	US $	US $
1999	0/14	6,860	0	39,000	6/0	20,700	0/14	5,040	0	0	0	71,600
2000	0/14	7,210	0	72,000	3/0	10,800	0/28	10,640	0	0	0	100,650
2001	0/0	0	0	0	8/0	30,000	0/0	0	0	0	0	30,000

First Year Approved: 1999

OBJECTIVES: To produce legume and cereal biofertilizers and promote their use through on-farm demonstrations.

BACKGROUND: The standard of living in Pakistan is dependent on agricultural productivity, the most important crops being cereals such as rice and wheat, and legumes such as chickpea, mungbean and lentil. Legumes are grown on about 10% of the total 20.9 million ha of cultivated land, while the area under cereals is over 50%. Nitrogen fertilization is one of the major inputs to crop production; its consumption in 1995-1996 was 2.3 million metric tons. The production of mineral nitrogen fertilizers uses huge amounts of non-renewable energy resources, making it the most expensive factor in agricultural production. According to one estimate, Pakistan uses nearly 20% of its entire natural gas consumption for the production of nitrogenous fertilizers. In addition to the cost of production, a great deal of energy is also used for transportation and storage. Also, mineral nitrogen fertilizers contribute to environmental pollution. Thus, nitrogen biofertilizers would play a major role in increasing crop productivity at low cost and in an environmentally friendly way. Research in Pakistan has shown that substantial benefit could be derived by farmers and the country from an increased use of legume and cereal biofertilizers. A pilot plant for the production of biofertilizers has been set up at the National Institute for Biotechnology and Genetic Engineering (NIBGE). The Government plans to involve the private sector in biofertilizer production, promotion and marketing to ensure that the technology is sustainable.

PROJECT PLAN: The following activities are planned: (i) selection of efficient strains of nitrogen fixing and growth promoting bacteria (ii) upscaling biofertilizer production from laboratory and pilot scale to larger capacities (iii) establishment of QC protocols and standards (iv) field evaluation of biofertilizers and on-farm demonstration of their benefits (v) promotion of biofertilizer use through the private sector.

NATIONAL COMMITMENT: Personnel for research and extension; laboratory facilities; biofertilizer production facilities; transportation and operating costs.

AGENCY INPUT: Expertise in the production and use of legume and cereal biofertilizers, equipment and supplies; fellowship training.

PROJECT IMPACT: The increased use of biofertilizers will have a great impact on the economy by increasing agricultural productivity. In recent rice biofertilizer trials in farmers' fields, an average increase of about 500 kg/ha in paddy yield was obtained. If this is extrapolated to the whole rice growing area, there is a potential additional yield of one million tonnes, worth US $125 million. Similar trials with various legume crops have resulted in yield increases of 20-30%, estimated at about US $139 million. The use of the biofertilizers will also reduce the dependence on chemical fertilizers and save on non-renewable energy resources. Based on the 1995-1996 annual consumption figures, a 10% cut in mineral fertilizer use due to the adoption of biofertilizer would result in annual savings of US $57.5 million. In addition to its economic benefits, the use of biofertilizers will reduce environmental hazards associated with excessive mineral fertilizer use.